



THE ONTARIO TOBACCO RESEARCH UNIT  
UNITÉ DE RECHERCHE SUR LE TABAC DE L'ONTARIO

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# Commercial Tobacco Reduction in Indigenous Communities

## 2017 Literature Update

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## Introduction

Indigenous peoples globally often represent populations disproportionately affected by tobacco use. In the United States, Australia and New Zealand commercial tobacco use prevalence among indigenous peoples remains high at 22%, 39%, and 33% respectively.<sup>1</sup> Smoking prevalence among indigenous groups globally often exceeds that of non-Indigenous and settler populations in the same regions or nations. Māori in New Zealand have a higher smoking prevalence than the European population, while First Nations, Métis and Inuit people have a significantly higher smoking prevalence than non-indigenous Canadians.

This report examines recent research published since the Minichiello et al 2016 paper *Effective strategies to reduce commercial tobacco use in Indigenous communities globally: A systematic review*.<sup>1</sup> Minichiello et al reviewed the literature to:

- Assess which interventions demonstrated efficacy for changes in tobacco control outcomes (smoking prevalence, policies, health behaviours, etc.) in Indigenous communities
- Uncover common tobacco control strategies being utilized in Indigenous communities
- Explore how programs interact with, or support, Indigenous beliefs, knowledge, and skills

The key findings from Minichiello et al were that:

- Education alone (either community or school based education) led to positive changes in reducing initiation rates, but did not have any measured effect on reducing consumption
- Few interventions found meaningful community-level change
- However, a number of programs reported high levels of community engagement and ownership

Interventions with positive changes were led by community members, implemented in partnership with non-Indigenous health workers, and offered as mainstream health services. Communities

also showed preferences for ‘within the community’ messages.

This literature update uses the same search strategy used in Minichiello et al to include studies published between August 2015 and January 2017. Interventions at all levels were eligible, including change in individual behaviour, community level, policy, and legislation. Articles were assessed for study quality and summaries of the recent studies are described.

### Search Strategy and Outcomes

To assess new literature published between August 2015 and January 2017, the literature search (as described in Minichiello et al<sup>1</sup>) was repeated in January 2017. Four databases were searched for this update: PsychINFO, Embase, CINAHL and Medline.

Two hundred and seventy-nine (n=279) articles were identified through the literature search. One hundred and eleven (n=111) were excluded as duplicates and 102 were excluded after first stage screening due to lack of relevance to the research question. Of the 66 remaining articles, studies captured in the 2015 Knowledge Synthesis (January to August 2015) were excluded. Second stage screening resulted in 18 included articles. No relevant additional reports were identified outside of the literature search protocol. Of the 18 included studies, 6 were evaluated as strong quality, 8 as moderate quality and 4 as low quality. Study strength was categorized using the Quality Assessment Tool from Minichiello et al.<sup>1</sup> The following reports on findings from the 14 strong and moderate quality articles and reports.

### Article Descriptions

Eight articles were from the U.S.A. concerning American Indians and Alaska Natives, and none were from Canada. Two articles were from Australia concerning Australian Aboriginals and Torres Straight Islanders. Three were from New Zealand and included Māori and non-Māori populations. One article comprised study sites in Australia and New Zealand with Australian Aboriginals and Torres Straight Islanders and Māori people. Two randomized controlled trials were included – one from America and one from Australia and New Zealand combined. One quasi-experiment from New Zealand was included. Two modelling studies were included, which produced estimates of the

equity effects of tobacco policy changes in New Zealand. Three articles were evaluations of programs, one article was a comparative study of existing interventions, and three articles were surveys of opinion data. Two used a collaborative policy development approach, in which researchers partnered with community leaders and business owners to establish and implement tobacco control policies relevant to the communities' needs. Three low quality articles described feasibility studies in New Zealand,<sup>2,3,4</sup> while one low quality article reviewed the use of technology based cessation for disadvantaged groups.<sup>5</sup>

### Strong Quality Articles

#### All Nations Breath of Life—A Randomized Trial of Smoking Cessation for American Indians

The authors performed a randomized controlled trial of a smoking cessation intervention.<sup>6</sup> Self-identifying American Indians and Alaska Natives from both Southern and Northern Plains regions were recruited and followed up between April 2011 and July 2014. A total of 463 participants (75% women) were included and cluster randomized to two study arms. The treatment arm (n=243) used the All Nations Breath of Life (ANBL) smoking cessation intervention and was compared to the control arm (n=220) of current best practices (CBP) for cessation.

The ANBL intervention is built on community-based participatory research and comprises individual, group and in depth telephone counseling sessions, culturally tailored educational programming, free nicotine-replacement therapy (NRT), and tailored Indigenous cultural materials as incentives. ANBL focused messaging on tobacco being a sacred plant requiring respect and discouraging recreational use of commercial tobacco. The ANBL sessions each used an American Indian facilitator. The CBP arm comprised only individual in-person and brief telephone sessions, facilitated by a non-American Indian person, non-tailored education, free NRT, and non-tailored incentives. Both arms used self-reported quitting, salivary cotinine and exhaled carbon monoxide to measure smoking cessation, with the primary outcome being salivary cotinine 7-day point prevalence of smoking abstinence at the six month follow up period.

Intention to treat results for self-reported smoking abstinence showed the culturally tailored ANBL

intervention provided 91% increased odds of quitting (OR: 1.91; 95% CI: 1.07, 3.42) compared to the CBP arm at six month follow up. However, cotinine-verified smoking abstinence intention to treat results showed no significant difference in cessation at six month follow up between intervention and control arms (OR: 1.65; 95% CI: 0.80, 3.43).

Smoking abstinence results between the study arms are as follows:

- 12 weeks: 11.2% ANBL vs 8.8% CPB (OR: 1.31; 95% CI: 0.64, 2.73)
- 6 months: 10.8% ANBL vs 6.9% CPB (OR: 1.65; 95% CI: 0.80, 3.43)

Notably, there was a high uptake of NRT among American Indian smokers, which was provided free to participants in both study arms. The ANBL arm had higher participant retention than the CPB arm, despite the greater time commitment and participant involvement, which included multiple in-person group sessions. Both study arms experienced significant loss at follow up and a reduced number of salivary samples collected, which lowered the power of the study to detect significant differences in cessation rates. Authors note that because intervention components were not identical for each participant and were delivered in concert, it was not possible to dissociate specific effects of individual components on cessation.

The authors suggest that specific attention to community social networks may improve smoking cessation interventions among Indigenous communities in the U.S. by using techniques such as graphic warning labels to increase the influence or interactions of peers and family for cessation; however, no significant results were found in this trial.

### **Effect of a Family-Centered, Secondhand Smoke Intervention to Reduce Respiratory Illness in Indigenous Infants in Australia and New Zealand: A Randomized Controlled Trial**

This study reports on a block randomized controlled trial to assess a family-centered intervention intended to reduce secondhand smoke (SHS) exposure to decrease rates of hospitalization for acute respiratory illness (ARI) among Indigenous infants.<sup>7</sup> Two study locations comprised communities in Australia and New Zealand and eligible participants included Australian Aboriginals and Torres Straight Islanders and Māori people. Randomization of participants to the

study arms was stratified by country. A total of 321 mother-infant dyads who lived in homes with at least one smoker were recruited: 228 from New Zealand (115 in intervention arm and 113 in control arm) and 93 from Australia (46 in intervention arm and 47 in control arm).

The dyads were randomized to a treatment arm comprising a secondhand smoke intervention of three home visits and usual infant care, in which care givers discussed reducing SHS exposure at each visit, behavioural coaching to reduce SHS, role modelling, strategizing support, free nicotine replacement therapy and optional intensive cessation counseling. Most intervention health care workers were Indigenous people. The control arm comprised usual infant care and brief cessation advice from caregivers. The intervention focused on infant health by reducing SHS exposure using a whole-family approach, rather than smoking cessation in adult family members. Infant SHS exposure was tested by urinary cotinine or creatinine ratios, and caregivers recorded mothers' reports of SHS exposure. The primary outcome was infant ARI-related visits to a healthcare provider. At baseline, about 75% of mothers reported smoking during pregnancy, 66% of mothers were current smokers, and 69% reported having a partner who smokes. Intervention arm care visits occurred at 1, 2, and 3 months and midpoint and endpoint data collection of measures were taken at 4 months and 12 months.

There was no significant difference between the intervention and control arms in ARI-related visits (intervention: 471 events; usual care: 438 events; IRR = 1.10; 95% CI: 0.88, 1.37). At 4 and 12 months follow up, most mothers reported low SHS exposure for the infants, though there was no significant difference between study arms. Over the 3 month intervention period 24-30% of mothers agreed to attempt cessation and only 2-7% of mothers did not apply smoking restrictions for their homes and cars. At baseline, 70% accepted free NRT, which dropped to 41% at 3 months. Family members in the intervention arm were also provided with cessation support.

The SHS intervention did not significantly impact ARI-visits for infants but did lead to the development of smoke-free spaces and encouragement of quit attempts.



## Changes to Smoking Habits and Addiction Following Tobacco Excise Tax Increases: A Comparison of Māori, Pacific and New Zealand European Smokers

This study assessed cessation attempts and cigarette consumption over the course of New Zealand's national level 10% annual serialized tobacco excise tax increases in 2012.<sup>8</sup> Authors analyzed Māori and European populations by sex and assessed their quit rates, attempts and relapses from baseline in 2012 over a 2 year follow up period after the excise tax implementation. Participants comprised 357 smokers from Auckland, Wellington, Christchurch and Dunedin. Participants were included if they were daily smokers over 18 years of age and had no intention to quit smoking. The mean age was 36.95 years.

Authors used the tobacco excise tax increase as a quasi-experiment to assess change in cigarette consumption in the sample. Four measures recorded from participants over in person and telephone interviews comprised:

- the Fagerstrom Test of Nicotine Dependence
- the Glover-Nilsson Smoking Behaviour Questionnaire
- the Autonomy Over Smoking Scale
- Cigarettes per day consumed

Scores at baseline and at 1 and 2 year follow up were compared between Māori and Pacific Islanders and NZ Europeans.

There was significant loss to follow up with 45% responding at the 2 year follow up period. By all four measures taken, there were no statistically significant differences between Māori and European participants using ANOVA or chi-squared tests. All four measures resulted in significant linear declines over the course of the quasi-experiment, indicating broadly improved health behaviours resulting from the tax increase. There was a significant reduction in cigarettes per day from 14.76 to 9.29 among total participants, including both Māori, Pacific Islanders and European participants. The greatest decline was among Māori and Pacific Islanders men, from about 17 to 8 cigarettes per day, which equaled the cigarettes per day for Māori and Pacific Islanders women at the 2 year follow up period.

This study suggests that Māori and Pacific Islanders smokers may have a higher price sensitivity to cigarette price changes than European smokers in New Zealand and that tax/price interventions could be successful at reducing the prevalence of smoking.

### **Plain Packaging Implementation: Perceptions of Risk and Prestige of Cigarette Brands Among Aboriginal and Torres Strait Islander People**

This study assessed Aboriginals' and Torres Strait Islanders' perceptions of risk and prestige for different cigarette brands prior to and following Australia's implementation of plain packaging of tobacco products with larger graphic health warnings.<sup>9</sup> The data represents a subset of the larger Smoke Ring Study survey in Australia. The present study used a pre/post design with a baseline survey (n=94) taken in 2012 prior to full plain packaging implementation, and a follow up survey (n=98) in 2013 after implementation. Eligible respondents were recruited in the Australian Capital Territory.

Overall, there was a statistically significant reduction in the perception that brands differed in harm from 25.1% to 13.4% in the follow up after the implementation of plain packaging policy along with expanded package health warnings. There was a marked age difference in comparing pre and post plain packaging responses to whether brands differ in prestige or risk of harm, namely, whether some cigarettes are more harmful than others and whether some are more desirable or prestigious. Younger participants (35 years or younger) showed a decline in the belief that cigarette brands differed in prestige from baseline to follow up (54.4% down to 37.9%) and for perceptions that harm differs by brand (26.9% down to 9.4%). Older participants showed less change in perceptions that prestige differs (34.3% up to 44.9%) and harm differs (23.5% down to 17.5%). The strongest effects measured were among participants younger than age 35. Authors note that it may be more difficult or take longer for the effects of plain packaging to alter perceptions of risk or prestige among older people. Additionally, there were non-significant changes in perceptions among smokers versus nonsmokers.

The findings broadly lend support for plain packaging implementation, with significant effects observed among younger Aboriginal and Torres Strait Islander people.

## Measuring Indoor Air Quality and Engaging California Indian Stakeholders at the Win-River Resort and Casino: Collaborative Smoke-Free Policy Development

The authors report on a seven year collaboration from 2008-2015 between public health professionals and the Win-River Casino operated by the Redding Rancheria tribe in Redding, California to develop a smoke-free policy for the casino.<sup>10</sup> On site measurements included area concentration of airborne nicotine and PM<sub>2.5</sub> and both PM<sub>2.5</sub> exposure and urinary cotinine among employees and visitors. Surveys, focus groups and town hall meetings provided data on opinions and emotions towards the smoking policy. Tribal leadership was consulted and presented with evidence of the exposure levels in the casino.

Over the course of the seven year study, investigators used a variety of surveys and meetings to gather data from casino employees, visitors from different income strata and from tribal members and leaders:

- Patron, Employee, and Tribal Member Initial Survey Responses-2008
- Follow Up Survey Responses-2012
- Focus Group Results-2013
- Town Hall Meeting and Feedback Cards-2013
- Employee Post-Policy Survey Responses-2014
- Key Informant Interviews-2015

The Tribal Council adopted a 100% smoke-free policy for the casino in 2014, which saw declines in the casino's PM<sub>2.5</sub> exposure from 72 to 1.1 µg/m<sup>3</sup> PM<sub>2.5</sub> (98% reduction). However, the casino adopted a partial smoke-free policy in 2015 as they faced reduced revenue. The authors note that the community collaborative experience coupled with exposure measurements may offer useful insights for other smoke-free policy interventions that intend to operate in and impact Indigenous communities.

Special attention to context and the Indigenous community's needs are important levers to a collaborative policy approach.

### A Multilevel Health Promotion Intervention in Minority-Owned Workplaces

This study evaluated an intervention aimed at four Native American owned workplaces: a health care and wellness centre with federal funding, a health facility, a tribal headquarters, and a Native American owned casino.<sup>11</sup> The workplaces received \$1000 each to implement intervention activities. The workplaces comprised 120-520 employees, with between 60-90% Native American employees.

This study introduced a host of workplace health interventions and business owners could select the ones they wished to act on. The interventions were selected from federal-level evidence-based recommendations for workplace health: the US Preventive Services Task Force and the Task Force on Community Preventive Services. Workplace interventions were adapted to be culturally appropriate with relevant Native American imagery and references. The interventions were established through 2-3 in person meetings and 3-4 telephone calls or emails over the 1 year intervention period.

The tobacco control related interventions were:

- Workplace smoking bans or restrictions (chosen at 2 sites)
- Sponsor a tobacco cessation quitline with nicotine replacement therapy (chosen at 2 sites)
- Insurance benefit for nicotine replacement therapy
- Eliminate out-of-pocket expenditure for cancer screening, flu shots and smoking cessation (chosen at 2 sites)

Across the 4 workplaces 6 out of the 16 total chosen interventions were tobacco control related. The follow up period for evaluation was 1 year. Outcome evaluation used a point-based scale to score the success of implementation for each program selected at the workplaces. Each of the tobacco related interventions, except the workplace smoking ban, showed statistically significant improvement from baseline to follow up (Wilcoxon paired signed-rank test; statistics not reported). Participants noted the 1 year follow up period may have been too short a time frame to fully implement interventions. In particular, difficulty was noted implementing workplace smoking bans

in the context of tribal policies respecting Native American employees' tobacco use. Authors note a study limitation was choosing not to use a randomized controlled design and the small sample size of four workplaces.

Workplace tobacco interventions can be effective but must respect the context of Indigenous tobacco use.

### Moderate Quality Articles

#### Developing a Biomarker Feedback Intervention to Motivate Smoking Cessation During Pregnancy: Phase II MAW Study

This study assessed smoking cessation among pregnant Alaska Native women using biomarker feedback.<sup>12</sup> Researchers were part of a partnership between the Alaska Native Tribal Health Consortium (ANTHC) and Southcentral Foundation (SCF) in Anchorage, Alaska and Mayo Clinic in Rochester, Minnesota. Enrollment and data collection occurred from 2013 to 2014. Authors used qualitative interviews to assess the efficacy for smoking cessation among pregnant Alaska Native women by providing information on individualized smoking biomarkers including maternal cotinine and neonatal exposure to the carcinogen 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol (NNAL).

Content analysis was conducted on 39 interviews comprising 16 pregnant women, 12 postpartum women, and 11 partners. The mean age of women was 28.1 years. All but one of the pregnant or postpartum participants was a current smoker. Overall, participants expressed that personalized biomarker results helped motivate smoking cessation while generalized information was less helpful. The authors note that general information on the health hazards of smoking to women and to the fetus in-utero may also benefit from the additional individualized data provided by biomarker testing such as urinary cotinine. Some cessation barriers identified included stress and having a familial and social network with many smokers. Authors note that increasing Alaska Native pregnant and postpartum mothers' awareness of the risks of smoking to the fetus may be effective at driving cessation, and individualized biomarker results may aid in this process. Reviews of biomarker feedback have produced mixed results for risk communication to smokers.

### Evaluation of the Pilot Phase of the ‘Give Up Smokes For Good’ Social Marketing Campaign

This study surveyed participants among Aboriginal and Torres Strait Islander people in Australia to evaluate the impact and exposure of the “Give up the smokes for good” social-marketing campaign released in South Australia in 2011.<sup>13</sup> The convenience based sample comprised 94 participants in town regions (rural) and 96 participants in the city region (urban). The “Give up the smokes for good” campaign comprised multi-media advertisements spread across both rural and urban pilot areas. Local Aboriginal celebrities were included in the campaign as cessation advocates. For the evaluation, in-person surveys were conducted to measure the campaign’s success for smoking cessation, culturally relevant messaging and imagery and exposure or reach. A total of 76% of participants were aware of the campaign. Three-quarters of participants had smoking bans in their homes and cars and about 86% had knowledge that smoking caused illness. A total of 92% of participants reported that the campaign materials were culturally appropriate for Aboriginal Australians. The evaluation established that awareness of the campaign was high and it was relevant and appropriate for the Aboriginal community. However, the evaluation could not dissociate the precise impact of the campaign on home smoking bans, cessation attempts or overall smoking prevalence.

### Speaking Out About Physical Harms From Tobacco Use: Response to Graphic Warning Labels Among American Indian/Alaska Native Communities

This study comprised 220 American Indian and Alaska Natives within a larger multi-racial graphic warning labels study between 2012-2013 comprising 1571 participants.<sup>14</sup> Indigenous participants were recruited via convenience sampling through community partners in 14 U.S. states. The intervention involved exposing participants to graphic warning labels. Participants viewed a series of images of nine graphic warning labels and rated their emotional reactions to each, namely: anger, disgust, sadness, regret, worry. The image of a baby exposed to secondhand smoke garnered the highest mean anger, sadness and worry. This image also elicited the strongest response for thinking about friends or family who smoke. For all images, participants reported higher likelihood of discussion about the image and their emotions with friends or family compared to teachers or doctors.

## Use and Effectiveness of Quitlines Versus Web-Based Tobacco Cessation Interventions Among 4 State Tobacco Control Programs

A study of telehealth tobacco cessation interventions in four U.S. states compared the effectiveness of telephone based quitlines to web-based cessation services.<sup>15</sup> The programs, in Alabama, Arizona, Florida, and Vermont, were U.S. Centers for Disease Control-funded tobacco control programs. Free nicotine-replacement therapy was provided to users of the CDC-funded quitlines or web-based interventions for periods ranging from 2 weeks in Alabama to 8 weeks in Vermont. The study's primary outcome was 30-day point prevalence abstinence (PPA) for users of the quitlines or web-based interventions at 7 months follow up.

This article had a small sample of indigenous participants and lacked information specific to indigenous tobacco use or cessation. Among 16,332 eligible users, participants were selected from interested applicants who were only using one of the available services. A total of 4086 people were included across the four states, of which 41 (1%) identified themselves as American Indian or Alaska Native. The small, geographically diverse sample of Indigenous people (1%) precluded generalization of the effects of the two interventions. The American Indian and Alaska Native participants had 22% greater odds of a 30-day PPA at the 7 months follow up period compared to white non-Hispanic participants (OR: 1.22; 95%CI: 0.64–2.35). Overall, quitline users had 26% greater odds of 30-day PPA at follow up compared to web-based users (OR: 1.26; 95%CI: 1.00–1.58).

## The Tribal Tobacco Education and Policy Initiative: Findings From a Collaborative, Participatory Evaluation

This evaluation assessed policy advocacy in Tribal Nations using a collaborative policy change initiative in Minnesota.<sup>16</sup> It comprised four Tribal Nations: three Ojibwe and one Dakota. Authors used mixed methods qualitative and quantitative data from 2010 to 2013. The Tribal Tobacco Education and Policy Initiative (TTEP) was developed by the Minnesota Tribal Nations to coordinate tobacco control across populations.

The TTEP evaluation framework comprised the following questions:

- What types of activities facilitate tobacco-related policy and norm changes in tribal communities?
- How do these approaches compare to tobacco control approaches more typically used in mainstream settings?
- Can this work bring about community-generated change that helps restore tradition while reducing commercial tobacco use?

Data was collected using an online tool called the Tribal Tobacco Story, which provides evaluation methods to generate data on activities, strategies and indicators for health behaviour and policy changes including tobacco control. Data was collected by evaluators and no data was recorded from or by individual participants. Of the 723 collected data points from Tribal Tobacco Story, tobacco control emerged as a major theme. Thirteen listening sessions among evaluators provided qualitative data and harmonized results across study sites.

Policy initiatives observed in the evaluation included creating smoke-free policies, restoring traditional tobacco to supplant commercial tobacco use and reducing tobacco industry marketing. Smoke-free policies included education for secondhand smoke risks, tribal policy changes and tobacco cessation services. Qualitative analysis revealed that traditional tobacco was an important aspect of overall policy change and a consideration for any tribal health policy. Evaluators found the participating Tribal Nations did not use available “outside” support for tobacco control policies and instead preferred to rely on internal tribal advocacy for policy changes. Overall, 81 policy changes were observed, with 61 focused on creating smoke-free policies and 11 on restoring traditional tobacco use. Smoke-free policy activities included community events, policy adoption, and policy enforcement.

Authors note that the overall tobacco-free movement fails to consider the context of Tribal Nations in the Americas where traditional tobacco is sacred and attempts to restore traditions are a facet of commercial tobacco use reduction.



## **The Efficacy of an American Indian Culturally-Based Risk Prevention Program for Upper elementary School Youth Residing on the Northern Plains Reservations**

This study assessed the effects of the Lakota Circles of Hope (LCH) program on young student self-efficacy, self-worth, identity, respect, communication and risk behaviours, including tobacco use.<sup>17</sup> The LCH program is offered annually to students in grades two to five and aims to prevent substance use, depression and other mental health concerns. The study setting was four American Indian reservations in South Dakota. Purposive sampling was used to recruit students at reservation schools. Participants answering the surveys were allocated into intervention and comparison groups comprising 1531 students at baseline and 1145 at the follow up period over the 3 year study (study years were not included). Intervention participants received the LCH education program at their schools, while those in the comparison group did not.

At the 3 year follow up period there was a statistically significant difference in the communication survey variables for child and parent between the two study groups (F statistic used). The risk behaviour survey variables showed increasing abstinence of alcohol, marijuana and sex in the intervention group. However, changes in tobacco use were not statistically significant over the study period.

## **Modelling the Implications of Regular Increases in Tobacco Taxation in the Tobacco Endgame**

This modelling study of different levels of tobacco excise tax increases in New Zealand provides a perspective on the effects of increasing taxation on Māori and non-Māori people, and identifies gaps that may require additional interventions in combination with tax increases.<sup>18</sup>

New Zealand's adult smoking prevalence is 15.1%, and the country has a goal to reach less than 5% by 2025 (smoke-free status). Authors point out that at present, smoking prevalence inequities exist for Indigenous peoples: 31% and 35% of Māori men and women smoke, while 15% and 11% of non-Māori men and women smoke, respectively. Smoking uptake and cessation rates were derived from changes in smoking prevalence using the 2006 and 2013 Censuses of New Zealand. The study

used an overall price elasticity of demand of -0.47 for New Zealand, with age stratified prevalence elasticities and multiple variant models.

In a baseline model with no additional tax increases above the level at the time of this publication, on current trends the future smoking prevalence is estimated at 9.9%. Māori smoking prevalence would fall to about 20.5%. Following this trend, total prevalence would reach <5% only by 2046. An annual 20% increase in tobacco excise tax yields a 2025 prevalence estimate of 7.6%, and 15.5% among Māori people, which is comparable to the 2016 prevalence for non-Māori people. In this model, <5% prevalence would be reached by 2034. Authors include an alternative model with 50% greater price elasticity for Māori people, but no significant difference in the 2025 prevalence outcome was estimated.

In the 20% annual tax increase model, by 2025 important inequities may be exacerbated in New Zealand between Māori and non-Māori smokers. In that model the 2025 per cigarette street-level price is expected to be \$5.60, while the relative difference in Māori to non-Māori smoking prevalence may increase from twofold to threefold. Thus, the pace of taxation increases would create greater inequity as it exceeds the pace of cessation among Māori people, according to the model. The eventual economic burden on smokers by 2025 resulting from tax increases may inequitably impact the Māori population as they would have substantially higher smoking prevalence than the non-Māori population. Authors suggest this potential widening of inequity points to the need for multiple interventions to compliment tobacco taxation, with targeted and tailored interventions for Māori people.

### **Tobacco Retail Outlet Restrictions: Health and Cost Impacts From Multistate Life-Table Modelling in a National Population**

This modelling study estimated the impact on health and smoking prevalence of various tobacco retail outlet restrictions in New Zealand.<sup>19</sup>

Four tobacco retail restriction models are as follows:

- Restrict sales to only 50% of liquor stores
- Restrict sales to areas 1km or more away from any grade school
- Restrict sales to areas 2km or more away from any grade school
- Restrict sales to only 5% of current outlets

The model interventions accounted for the price of new legislation, changes in the contraband tobacco market, changes in travel costs (transportation) to points of sale and tobacco price elasticity changes in conjunction with travel costs. Tobacco price elasticity was increased by 20% for the Māori population over the non-Māori population. Authors operationalized increased travel costs as equivalent to a street-level tobacco price increase.

Each of the four models were estimated to reduce tobacco retail outlets by about 89% over 10 years. Authors found that the model in which tobacco retail was restricted to only 50% of stores which also sell liquor was most effective at reducing access and smoking prevalence, and increasing the notional costs of tobacco products. This model raised the estimated cost of a pack to NZ\$51 in rural areas and NZ\$23 in urban areas (notional cost includes estimated travel costs to purchase with retail restrictions). With this model, New Zealand's overall smoking prevalence would fall from 9.9% to 9.1% by 2025 (with no additional control measures) and about 129,000 quality adjusted life years (QALY) would be saved. The 50% of liquor stores model was also found to save the New Zealand health care system about NZ\$1.82 billion (over remaining lifetime of 2011 New Zealand population). Authors note that retail location interventions appear to close health equity gaps in smoking for Māori people, with an estimated fivefold greater gain in QALYs per capita compared to non-Māori people (93.7 vs 17.7 per 1000 population).

### Discussion

No new articles with study settings in Canada were captured by this literature update. Additional populations of interest that were not captured include Indigenous peoples of Central and South America, Taiwan, Papua New Guinea and Micronesian Islanders. Limiting the search strategy to English articles may have excluded some Chinese or Spanish language articles.

One theme that emerged from a majority of included studies is participant interest in accessing free NRT and the pronounced lack of free access across the included Indigenous populations. Cost appeared to be a limiting factor in accessing NRT and insurance provided free NRT may be a major asset in successful smoking cessation, especially among American Indians and Alaska Natives as the U.S.A. does not have a single payer health care system. Improving access to NRT may also complement and improve efficacy for non-pharmacological tobacco control intervention.

Policy interventions appeared to be effective at the community and macro population levels. One study directly measured the effects of a policy change using Australia's tobacco product plain packaging intervention. It provided evidence for the efficacy of plain packaging among Aboriginal people and Torres Straight Islanders. Tobacco taxation increases and retail outlet, or point of sale, reduction were modelled in two studies estimating policy effects over time on prevalence and consumption. The two modelling studies used a wealth of national-level data from New Zealand. For other Indigenous populations globally, data availability and access is a significant barrier to assessing overall disease burdens and intervention impacts. Data availability is a particular concern among the South American, Asian, Oceanic and other populations not captured in this synthesis. Sharing data and lessons from populations with greater data availability, such as Māori populations in New Zealand, may yield relevant insights for intervention implementation in hard to reach indigenous populations elsewhere.

Two studies explored differences in price sensitivity and price elasticity of demand between Indigenous tobacco users and settler populations. Both included modelling studies that presented models with higher price sensitivity for Māori people compared to non-Māori. This may be an important consideration for other Indigenous populations globally when assessing effects of tobacco tax increases and potential impacts on widening inequities, as noted in Cobiac et al.<sup>18</sup>

Collaboration with, and leadership by, Indigenous peoples remains critical to successfully implementing tobacco control interventions among Indigenous communities. The two studies using collaborative policy development frameworks focused on reducing environmental smoke exposure rather than promoting individual behaviour change. Collaborators worked to implement local level policy changes and were initially successful but met with longer term policy roll backs as enforcement weakened or was discarded by community leaders.

The Minichiello et al systematic review found that leadership by Indigenous community members in tobacco control interventions, partnership with non-Indigenous workers in implementation and expanding access to mainstream health services to Indigenous communities were intervention elements that drove positive changes for tobacco control metrics (prevalence, cessation, smoking bans, etc.).<sup>1</sup> The present synthesis observes that the third element, access to mainstream services, emerged as a theme among the included studies that demonstrated efficacy. This may also be indicative of the intervention efficacy observed in the policy change studies. This may also signal a gap in tobacco control policy access among Indigenous communities.

### Key Findings

- Recent literature was consistent with the main findings of the Minichiello et al review noting the importance of self-determination and community engagement to effect change
- Lack of access to nicotine replacement therapy as a barrier to cessation was highlighted as a concern in a number of studies and the inclusion of free NRT access was used as an intervention
- An emerging focus on policy change interventions at the community and macro levels

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